

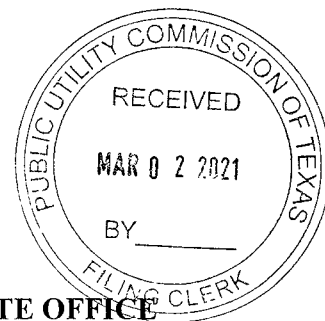


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Item Number: 220

Addendum StartPage: 0



SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415

APPLICATION OF SOUTHWESTERN §
ELECTRIC POWER COMPANY FOR §
AUTHORITY TO CHANGE RATES §
BEFORE THE STATE OFFICE
OF
ADMINISTRATIVE HEARINGS

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS FOR
INFORMATION**

MARCH 2, 2021

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Question No. CARD 7-1:

Please provide the current planned retirement date of each SWEPCO generating unit.

Response No. CARD 7-1:

See the Company's response to CARD 1-5.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-2:

Please provide SWEPCO's most recent economic analysis supporting the current planned retirement date of each of SWEPCO's coal- and lignite-fired generating units, including workpapers with calculations and underlying assumptions.

Response No. CARD 7-2:

Please see the supplemental response to CARD 2-10 for SWEPCO's most recent economic analysis supporting the current planned retirement dates for Pirkey, Welsh 1 and 2 and Flint Creek. In additions, please see the response to SC 1-5 for the most recent Dolet Hills economic analysis supporting the current planned retirement date.

CARD 7-2 HIGHLY SENSITIVE Attachment 1 responsive to this request is HIGHLY SENSITIVE PROTECTED MATERIAL under the terms of the Protective Order. Due to current restrictions associated with COVID-19, this information is being provided electronically and a secure login to access the information will be provided upon request to individuals who have signed the Protective Order Certification.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-3:

Please provide SWEPCO's two most recent economic analyses supporting the decision to operate each of SWEPCO's coal- and lignite-fired generating units during the test year for this case, including workpapers with calculations and underlying assumptions.

Response No. CARD 7-3:

Please see the response to SC 1-5 for the two most recent Dolet Hills economic analyses. Please see the supplemental response to CARD 2-10 and CARD 7-3 Attachment 1 for the two most recent Flint Creek economic analyses. Please see the supplemental response to CARD 2-10 and CARD 7-3 Attachment 2 for the two most recent Welsh economic analyses. Please see the supplemental response to CARD 2-10 and CARD 7-3 Attachment 3 and CARD 7-3 Attachment 4 for the two most recent Pirkey economic analyses. CARD 7-3 Attachments 1 - 4 are provided electronically on the PUC Interchange.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-4:

Please provide SWEPCO's three most recent Integrated Resource Plan (IRP) reports.

Response No. CARD 7-4:

Please see CARD 7-4 Attachment 1 for the 2015 SWEPCO IRP filed in Arkansas, CARD 7-4 Attachment 2 for the 2018 SWEPCO IRP filed in Arkansas and the response CARD 1-12 for the 2019 SWEPCO IRP filed in Louisiana. Both attachments are voluminous so they are provided electronically on the PUC Interchange.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-5:

Please provide the nameplate capacity (MW), and firm capacity (MW) used for SWEPCO's planning purposes, contract start date, and expected contract end date for each SWEPCO renewable energy purchased power agreement in effect during the test year in this case.

Response No. CARD 7-5:

See CARD 7-5 Attachment 1, for the nameplate capacity rating, contract start date, and contract expiration date, for SWEPCO's renewable purchased power agreements in effect during the test year. See CARD 7-5 CONFIDENTIAL Attachment 2 for the firm capacity used for SWEPCO's planning purposes.

CARD 7-5 CONFIDENTIAL Attachment responsive to this request is CONFIDENTIAL MATERIAL under the terms of the Protective Order. Due to current restrictions associated with COVID-19, this information is being provided electronically and a secure login to access the information will be provided upon request to individuals who have signed the Protective Order Certification.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Scott E. Mertz

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

SWEPCO Renewable Energy Purchase Agreements						
Project	Resource	State	RTO	Size MW (nameplate)	REPA Start Date	REPA End Date
Southwestern Electric Power (SWEPCO)						
Majestic	Wind	TX	SPP	80	01/20/09	01/31/29
Majestic II	Wind	TX	SPP	80	07/31/12	12/31/32
Flat Ridge 2	Wind	KS	SPP	31	01/01/13	12/31/32
Flat Ridge 2	Wind	KS	SPP	78	01/01/13	12/31/32
Canadian Hills	Wind	OK	SPP	100	12/22/12	11/20/32
Canadian Hills	Wind	OK	SPP	53	11/21/12	11/29/32
Canadian Hills	Wind	OK	SPP	48	11/30/12	12/21/32
SWEPCO total =				469		

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Question No. CARD 7-6:

Please provide SWEPCO's current estimate of purchased capacity prices (\$/KW-month or year) as used for the Company's most recent IRP.

Response No. CARD 7-6:

Please see CARD 7-6 Attachment 1.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Prepared By: Joseph S. Perez

Title: Forecast Analyst Prin

Sponsored By: Scott E. Mertz

Title: Regulatory Consultant Staff

SPP_Central (\$/MW-day)	
2019	28.48
2020	25.00
2021	25.00
2022	25.00
2023	25.00
2024	25.00
2025	25.00
2026	25.00
2027	25.00
2028	25.00
2029	25.00
2030	25.00
2031	25.00
2032	25.00
2033	25.00
2034	25.00
2035	25.00
2036	25.00
2037	25.00
2038	25.00
2039	25.20
2040	31.57
2041	38.79
2042	46.90
2043	55.91
2044	65.86
2045	76.78
2046	109.05
2047	150.93
2048	192.88
2049	234.90

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Question No. CARD 7-7:

Please provide SWEPCO's current estimate of purchased capacity prices (\$/KW-month or year) based on price bids received and/or reviewed by the Company within the last two years.

Response No. CARD 7-7:

SWEPCO has not received or reviewed any capacity price bids within the last two years.

Prepared By: Scott E. Mertz

Title: Regulatory Consultant Staff

Sponsored By: Scott E. Mertz

Title: Regulatory Consultant Staff

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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-8:

Please provide the SWEPCO's current estimate of new generation capacity costs (\$/KW-month or year) based on each new conventional or renewable generation resource alternative evaluated in the Company's most recent IRP.

Response No. CARD 7-8:

See CARD 7-8 Attachment 1.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Prepared By: Joseph S. Perez

Title: Forecast Analyst Prin

Sponsored By: Scott E. Mertz

Title: Regulatory Consultant Staff

		\$2019	On-going Escalation @	2.13%
Thermal Units	MW	<u>(\$/KW-yr)</u>		
CHP	15	2,290		
18V50SG Wartsila 18 MW reciprocating engine, natural gas	235	2,494		
JAC.02 CC	1299	833		
GE LM 6000 PF	116	1,412		
GE 7F.05	486	735		
Renewable Units	MW	<u>(\$/KW-yr)</u>		
Wind	200	1,189		
Solar T1	50	1,339		
Solar Tier 2	50	1,487		

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Question No. CARD 7-9:

Please identify any imputed capacity costs and the associated supply resource (owned or PPA) included in SWEPCO's base rates during the test year.

Response No. CARD 7-9:

SWEPCO did not include any imputed capacity costs in base rates during the test year.

Prepared By: Scott E. Mertz

Title: Regulatory Consultant Staff

Sponsored By: Scott E. Mertz

Title: Regulatory Consultant Staff

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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-10:

Please provide the project description, in-service date, project cost, and cost/benefit analysis supporting each capital project at Dolet Hills that has a cost above \$2 million and which is being requested by SWEPCO in rate base for the first time in this case.

Response No. CARD 7-10:

See the Company's response to CARD 1-17, the supplemental response to CARD 1-16, and Schedule H-5.2b.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-11:

Please provide the project description, in-service date, project cost, and cost/benefit analysis supporting each capital project at Pirkey that has a cost above \$2 million and which is being requested by SWEPCO in rate base for the first time in this case.

Response No. CARD 7-11:

See the Company's response to CARD 1-17, the supplemental response to CARD 1-16, and Schedule H-5.2b.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
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Question No. CARD 7-12:

Please provide the economic analysis along with supporting calculations and assumptions supporting the planned early retirement of the Dolet Hills plant, and identify any non-economic factors that were primary factors in the retirement decision.

Response No. CARD 7-12:

Please see Sierra Club 1-5 for the economic analysis supporting the planned early retirement of the Dolet Hills plant.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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Question No. CARD 7-13:

Please provide documentation provided to SWEPCO senior management to support the planned early retirement of the Dolet Hills plant, along with date of this decision.

Response No. CARD 7-13:

SWEPCO announced the decision to cease mining at the Oxbow mine that serves Dolet Hills on May 6, 2020. Please see the response provided for TIEC 1-17 for the requested documentation.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Prepared By: Christopher N. Martel

Title: Regulatory Consultant Sr

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Scott E. Mertz

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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Question No. CARD 7-14:

Please describe and provide the amount of any proposed adjustments to test year costs included in this case to reflect the planned early retirement of the Dolet Hills plant.

Response No. CARD 7-14:

Please see the Direct Testimony of Thomas P. Brice (pages 5 – 8), Michael A. Baird (page 23, and pages 48 and 49), and David Hodgson (page 5, and pages 22 and 24) regarding the proposed recovery of the remaining net book value of Dolet Hills.

Please see the response to CARD 2-13 regarding O&M and other expenses related to Dolet Hills.

Prepared By: Tiffany A. Powell Day

Title: Regulatory Acctg Case Mgr

Sponsored By: Michael A. Baird

Title: Mng Dir Acctng Policy & Rsrch

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Question No. CARD 7-15:

Please provide the economic analysis along with supporting calculations and assumptions supporting the recently announced planned early retirement of the Pirkey plant, and identify any non-economic factors that were primary factors in the early retirement decision.

Response No. CARD 7-15:

Please see the response to CARD 7-2.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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Question No. CARD 7-16:

Please provide documentation provided to SWEPCO senior management to support the recently planned early retirement of the Pirkey plant, along with date of this decision.

Response No. CARD 7-16:

Please see SC 1-5 for the documentation provided to SWEPCO senior management to support the recently planned retirement of the Pirkey plant, which was announced on November 5, 2020.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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Question No. CARD 7-17:

Please describe and provide the amount of any proposed adjustments to test year costs included in this case to reflect the planned early retirement or reduced future operations of the Pirkey plant.

Response No. CARD 7-17:

There were no proposed adjustments to test year costs included in this case to reflect the planned early retirement or reduced future operations of the Pirkey plant in 2023.

Prepared By: Tiffany A. Powell Day

Title: Regulatory Acctg Case Mgr

Sponsored By: Michael A. Baird

Title: Mng Dir Acctng Policy & Rsrch

**SOAH DOCKET NO. 473-21-0538
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FOR INFORMATION**

Question No. CARD 7-18:

Please explain why SWEPCO is proposing to continue operating the Pirkey plant through 2023 rather than immediately retiring the plant.

Response No. CARD 7-18:

Continuing to operate Pirkey will allow SWEPCO to continue to have sufficient capacity reserves to meet its SPP reserve margin requirement.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Scott E. Mertz

Title: Regulatory Consultant Staff

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

**SOAH DOCKET NO. 473-21-0538
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Question No. CARD 7-19:

Please describe and provide documentation of any efforts by SWEPCO to mitigate the Company's share of fixed fuel or capital costs of Dolet Hills that are expected to be unrecovered as of the date of retirement of the plant.

Response No. CARD 7-19:

All costs of mining, whether fixed or variable are fuel costs and do not impact base rates. Notwithstanding this fact, the Company offers the following:

In response to the seasonal operation and pending early retirement of the Dolet Hills plant, DHLC management took measures to optimize the single dragline operation at the Oxbow mine and reduce both capital and operations and maintenance (O&M) spending to only what is necessary to safely mine the output required for operation of the Dolet Hills plant through 2021. Since 2019, when the mine went to a single dragline operation, these measures include an approximate eighty-six percent reduction in staff, significant reductions in overtime labor and outside services, reduction and sale of unneeded equipment, and reduced capital and O&M spending. See CARD 7-19 Attachment 1, for a detailed breakdown of these staffing and cost reductions.

See also Section V of the direct testimony of SWEPCO witness Thomas Brice for the Company's proposal to offset remaining undepreciated capital costs of the Dolet Hills plant with excess ADIT.

Prepared By: Tara D. Beske

Title: Regulatory Consultant Staff

Prepared By: Michael H. Ward

Title: Regulatory Consultant Staff

Sponsored By: Amy E. Jeffries

Title: Coal Procurement Mgr

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

DOLET HILLS LIGNITE COMPANY (DHLC)				
Mine Incurred Costs for the Period 2017-2020 (SWEPCO Share)				
(\$000)				
	2017	2018	2019	2020
Production Cost				
Hourly Labor	7,977	7,715	5,291	2,054
Salary Labor	2,184	2,035	1,389	633
Benefits	3,727	4,213	3,624	2,157
Total Labor & Benefits¹	\$ 13,887	\$ 13,963	\$ 10,304	\$ 4,844
Operating & Maint Materials	11,477	11,639	6,519	2,549
Electric Power	1,840	1,610	1,237	705
Depreciation ²	844	2,625 ³	3,008 ³	3,090 ³
Leases	4,923	4,288 ³	4,578 ³	3,422 ³
Amortization	82	128	187	238
Outside Services	10,350	7,803	2,810	707
Taxes Other than FIT	1,079	1,168	1,004	1,060
AEP Overheads	1,037	1,065	1,062	566
Direct Billings	204	224	11	32
Final Reclamation/Mine Closure	1,258	2,221	2,924	2,812 ³
All Other	1,501	802	1,245	637
FIT	-1,989	251	761	212
Interest Expense	231	1,751	1,806	1,048
Net Income	599	750	859	1,001
Production Cost Subtotal	\$ 47,323	\$ 50,287	\$ 38,315	\$ 22,922
Mine Retirement Cost				
Accelerated Depreciation-Owned Assets	0	722	2,165	32,406
Accelerated Depreciation-Leased Assets	0	1,264	4,235	12,957
Accelerated Depreciation-Final Rec (ARO)	0	0	0	41,312
Severances	0	2,148	0	1,355
Warehouse Inventory Writeoff	0	0	0	2,787
Wetlands Writeoff	0	0	0	1,875
Mine Retirement Cost Subtotal	\$ -	\$ 4,133	\$ 6,400	\$ 92,691
Total Mine Incurred Cost	\$ 47,323	\$ 54,420	\$ 44,715	\$ 115,613

¹Reflects staffing reductions shown in Table 1 that were made in 2019 when the mine moved to a single dragline operation and further reductions in 2020 when active mining operations were discontinued

²Depreciation expense increase in 2018 reflects the addition of assets associated with the Oxbow mine development

³Excludes accelerated depreciation.

Table 1 - Dolet Hills Lignite Company Staffing Reductions			
Headcount Details	Jan-Mar 2019	Apr-Dec 2019	Dec 2020
Full Time Employees	264	183	46
Temporary Employees	57	0	0
Full Time + Temp	321	183	46

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Question No. CARD 7-20:

Please identify any differences between SWEPCO's proposed ratemaking treatment of Dolet Hills retirement costs (including any un-recovered investment) and the Commission-approved ratemaking treatment of retirement costs associated with Welsh 2.

Response No. CARD 7-20:

Prior to retirement of Welsh Unit 2 in Docket No. 40443, the Commission included Welsh Unit 2 in rate base and included all applicable expenses as the Unit would continue to operate when rates were effective and would be providing service to SWEPCO's Texas retail customers. The Commission did not alter the depreciable life in Docket No. 40443. In the first case after Welsh Unit 2 was retired (Docket No. 46449), the Commission allowed return of but no return on the Welsh Unit 2 net book value.

SWEPCO's proposal for Dolet Hills is consistent with Docket No. 40443 which includes the still operating unit in rate base and includes all applicable expenses so the unit can continue to operate at the beginning of the rate year. However, the unprotected excess deferred income taxes associated with the Tax Cuts and Jobs Act (TCJA), that was not available when the Welsh decisions were made, provides an opportunity not available in Docket No. 40443 or 46449. Capturing this unique opportunity, SWEPCO's proposal to use TCJA items to reduce the net book value of Dolet Hills is described in the Direct Testimony of Thomas P. Brice (pages 5 – 8) and Michael A. Barid (page 23, and pages 48 and 49) and David Hodgson (page 5, and pages 22 and 24).

Prepared By: Jason M. Yoder

Title: Dir Regulatory Acctg Svcs

Prepared By: Tiffany A. Powell Day

Title: Regulatory Acctg Case Mgr

Sponsored By: Michael A. Baird

Title: Mng Dir Acctng Policy & Rsrch

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-21:

Please identify any differences between SWEPCO's proposed ratemaking treatment of Dolet Hills retirement costs (including any un-recovered investment) and the Commission-approved ratemaking treatment of retirement costs associated with Welsh 2 in other (i.e., non-Texas) jurisdictions.

Response No. CARD 7-21:

Because SWEPCO's non-Texas jurisdictions had already addressed TCJA items, SWEPCO did not or will not have the opportunity to make a similar proposal in those jurisdictions. The Arkansas Commission allowed recovery of Welsh Unit 2 over the remaining lives of Units 1 and 3 with a debt return. SWEPCO has not filed a case in Arkansas that addresses Dolet Hills recovery. In Louisiana, SWEPCO is proposing recovery of Welsh Unit 2 over the remaining life of Welsh Units 1 and 3 with the remaining net book value being included in rate base. In this same case in Louisiana, SWEPCO is proposing recovery of Dolet Hills over 5 years with the remaining net book value being included in rate base.

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**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-22:

Please explain why SWEPCO believes that the Commission should approve a different ratemaking treatment of Dolet Hills retirement costs (including any un-recovered investment) than was approved by the Commission for Welsh 2.

Response No. CARD 7-22:

As noted in the response to CARD 7-20, SWEPCO's request in this case is consistent with Docket No. 40443 other than its proposed recovery of the remaining net book value. SWEPCO's proposal takes advantage of circumstances not available to the Commission in either Docket No. 40443 or 46449 (i.e. TCJA). SWEPCO believes the Commission should take advantage of the TCJA which will reduce the amount and time period customers will have to pay for the remaining net book value of Dolet Hills.

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**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-23:

Please provide any economic studies provided by SWEPCO within the last three calendar years in other regulatory jurisdictions addressing the planned retirement or economic viability of continued operations of the Pirkey, Dolet Hills, Welsh or Flint Creek plants.

Response No. CARD 7-23:

Please see the response to Sierra Club 1-5 and CARD 7-23 Attachment 1, CONFIDENTIAL Attachment 2 and CONFIDENTIAL Attachment 3 for the economic analyses provided by SWEPCO within the last three calendar years addressing the planned retirement or economic viability of continued operations of the Pirkey, Dolet Hills, Welsh, or Flint Creek plants.

CARD 7-23 CONFIDENTIAL Attachments 2 and 3 responsive to this request is CONFIDENTIAL MATERIAL under the terms of the Protective Order. Due to current restrictions associated with COVID-19, this information is being provided electronically and a secure login to access the information will be provided upon request to individuals who have signed the Protective Order Certification.

Prepared By: Mark A. Becker

Title: Mng Dir Res Plnning&Op Anlysis

Sponsored By: Thomas P. Brice

Title: VP Regulatory & Finance

Sponsored By: Monte A. McMahon

Title: VP Generating Assets SWEPCO

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BEFORE THE
ARKANSAS PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION)
OF SOUTHWESTERN ELECTRIC POWER) **DOCKET NO. 19-008-U**
COMPANY FOR APPROVAL OF A GENERAL)
CHANGE IN RATES AND TARIFFS)

DIRECT TESTIMONY OF

MARK A. BECKER

ON BEHALF OF

SOUTHWESTERN ELECTRIC POWER COMPANY

FEBRUARY 28, 2019

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SOUTHWESTERN ELECTRIC POWER COMPANY
DOCKET NO. 19-008-U
DIRECT TESTIMONY OF MARK A. BECKER

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DIRECT EXHIBITS

<u>DIRECT EXHIBIT</u>	<u>DESCRIPTION</u>
DIRECT EXHIBIT MAB-1	SWEPKO CDR for EARLY 2011 Analyses
DIRECT EXHIBIT MAB-2	Commodity Price Forecast for Early 2011 Analyses
DIRECT EXHIBIT MAB-3	Commodity Price Forecast for Post-2011 Analyses

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DOCKET NO. 19-008-U
DIRECT TESTIMONY OF MARK A. BECKER

I. INTRODUCTION

1
2 **Q. WOULD YOU PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND**
3 **POSITION?**

4 **A.** My name is Mark A. Becker, and my business address is 212 East Sixth Street, Tulsa,
5 Oklahoma. I am employed by the American Electric Power Service Corporation
6 (AEPSC) as a Resource Planning Manager.

7 **Q. WOULD YOU PLEASE DESCRIBE YOUR EDUCATIONAL AND**
8 **PROFESSIONAL BACKGROUND?**

9 **A.** I received a Bachelor of Science degree in Electrical Engineering from the University
10 of Arkansas in 1983. I have over 35 years of experience working for investor-owned
11 and municipal electric utilities and energy trading companies. The majority of my
12 experience, approximately 30 years, has been related to performing a utility's
13 resource planning and operational analysis functions using the proprietary long-term
14 resource optimization software models known as Strategist®, and more recently
15 PLEXOS®.

16 **Q. WHAT ARE YOUR RESPONSIBILITIES AS RESOURCE PLANNING**
17 **MANAGER?**

18 **A.** I am responsible for the coordination and performance of long-term generation
19 resource planning studies using the modeling software tools Strategist® and
20 PLEXOS® for Southwestern Electric Power Company (SWEPCO or the Company)
21 and the other regulated operating companies within American Electric Power
22 Company, Inc. (AEP). These Strategist® and PLEXOS® studies include the

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1 development of Integrated Resource Plans (IRP) and the economic evaluation of
2 generating unit disposition alternatives for AEP's regulated operating companies,
3 including SWEPCO. This includes ongoing evaluations of generating unit
4 disposition alternatives as external factors change which could alter the companies'
5 plans going forward.

6 **Q. HAVE YOU PREVIOUSLY FILED TESTIMONY ON BEHALF OF SWEPCO,**
7 **OR ANOTHER AEP OPERATING COMPANY WITH ANY REGULATORY**
8 **COMMISSION?**

9 **A.** Yes, in December 2016 I filed Direct Testimony in the Company's 2016 Texas Base
10 Rate Case (PUC Docket No. 46449) seeking recovery of capital investments made to
11 install environmental controls on Welsh Units 1 and 3, Flint Creek and Pirkey. In
12 May 2017, I filed rebuttal testimony and represented the Company at hearings in June
13 2017 in that same docket. In addition, I have represented SWEPCO in several IRP
14 stakeholder technical conferences as required by the Arkansas Public Service
15 Commission (APSC) and the Louisiana Public Service Commission (LPSC). I have
16 also filed testimony on behalf of AEP operating company affiliates in Oklahoma and
17 Kentucky. I filed Supplemental Direct Testimony and Rebuttal Testimony on behalf
18 of the Public Service Company of Oklahoma (PSO) in their 2003 Rate Case (Cause
19 No. PUD 200300076) and Direct and Rebuttal Testimony in their 2015 Rate Case
20 (Cause No. PUD 20150020). In addition, I filed Rebuttal Testimony on behalf of
21 PSO in Cause No. PUD 201200054 that sought the Oklahoma Corporation
22 Commission's authorization for the cost recovery of capital expenditures for

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1 environmental retrofit equipment. I have also filed Rebuttal Testimony in Kentucky
2 Power Company's November 2011 Environmental Compliance Plan filing (Case No.
3 2011-00401) and Direct Testimony in Kentucky Power Company's application (Case
4 No. 2012-00578) for a Certificate Of Public Convenience And Necessity for the
5 partial transfer of two of AEP Ohio Power's generating assets to Kentucky Power
6 Company. This is the first time I have filed testimony before the APSC.

7 **II. PURPOSE AND SUMMARY**

8 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

9 **A.** The purpose of my testimony is to present the economic analyses that were
10 considered by SWEPCO when evaluating its options to manage emissions from its
11 solid fuel generation fleet. Specifically, my testimony summarizes the Strategist®
12 and PLEXOS® unit disposition analyses conducted since January 2011 on the
13 Company's Welsh Units 1, 2 and 3 and Pirkey generating units. In general, those unit
14 disposition analyses evaluated the economics of the following alternatives:

- 15 1) Installing the environmental retrofit equipment to allow the continued
16 operation of those solid fuel units in light of emerging environmental
17 regulations, or;
- 18 2) Foregoing the environmental retrofits, and retiring and replacing those solid
19 fuel units with new natural gas combined-cycle (CC) generation, or market
20 capacity and energy, or;
- 21 3) In instances where feasible, converting those solid fuel-burning units to
22 natural gas burning units.

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1 **Q. ARE YOU SPONSORING ANY EXHIBITS WITH YOUR TESTIMONY?**

2 **A.** Yes. I sponsor the following Direct Exhibits:

3 DIRECT EXHIBIT MAB-1 SWEPCO CDR for EARLY 2011 Analyses

4 DIRECT EXHIBIT MAB-2 Commodity Price Forecast for Early 2011 Analyses

5 DIRECT EXHIBIT MAB-3 Commodity Price Forecast for Post-2011 Analyses

6 **Q. DID THE COMPANY PERFORM UNIT DISPOSITION ANALYSES ON THE**
7 **FLINT CREEK UNIT?**

8 **A.** Yes. During Fall 2011, Strategist® unit disposition analyses were performed on Flint
9 Creek in conjunction with the February 2012 filing (Docket No. 12-008-U) with the
10 APSC. The filing sought a declaratory order finding that the installation of
11 environmental retrofits at Flint Creek was in the public's best interest. On July 10,
12 2013, the APSC issued an order supporting the installation of the Flint Creek
13 environmental retrofits. The Company continued to evaluate the prudence of the
14 Flint Creek environmental retrofits through PLEXOS® unit disposition analyses
15 conducted in Summer 2014 and Summer 2015.

16 **Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?**

17 **A.** My testimony focuses on the series of economic analyses performed by the Company
18 on unit disposition alternatives at Welsh Units 1 and 3 and Pirkey. The series of
19 monthly economic analyses, beginning in January 2011 through May 2011 (i.e. Early
20 2011 analyses) provided the economic comparisons of those unit disposition
21 alternatives that aided the Company in deciding the future disposition of those units.
22 On June 9, 2011, the Company issued a press release indicating that Welsh Units 1

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1 and 3, Flint Creek and Pirkey would have the necessary environmental retrofits
2 installed to allow their continued operation, and that Welsh Unit 2 would be retired in
3 lieu of installing environmental retrofits. Mr. Thomas Brice discusses the
4 environmental rules impacting SWEPCO and the factors that led the Company to
5 these decisions. As an introduction to describing and summarizing the results from
6 the Early 2011 unit disposition analyses:

- 7 1) I discuss the Capability, Demand and Reserve (CDR) analysis used to
8 determine the need for generating resources to meet the Company's
9 customers' peak demand requirements, including satisfying the Southwest
10 Power Pool (SPP) minimum capacity margin requirement; and
11 2) I provide a summary of the commodity price forecasts for natural gas, coal,
12 SPP market energy and carbon dioxide (CO₂) emissions used as input
13 assumptions for those analyses.

14 I will then provide for the Welsh Units 1, 2 and 3 and Pirkey unit disposition
15 analyses conducted in Early 2011:

- 16 1) Proof of the need for the respective solid-fuel unit(s) through a CDR analysis
17 that assesses the Company's capacity position, if the unit(s) is retired;
18 2) Discussion of the environmental retrofit alternatives for the respective unit(s)
19 and the replacement alternatives, if the unit(s) is retired;
20 3) A summary of the capital cost of the environmental retrofits and replacement
21 alternatives; and
22 4) A summary of the results of the unit disposition economic analyses.

23 In addition to the Early 2011 unit disposition analyses, my testimony will
24 summarize the Company's continued due diligence in the form of economic analyses
25 conducted subsequent to these decisions. These analyses taken as a whole continued
26 to support the decision made in 2011 to install environmental retrofits on Welsh Units
27 1 and 3 and Pirkey.

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1 **Q. PLEASE SUMMARIZE THE TIMING AND THE RESULTS OF THE UNIT**
2 **DISPOSITION ANALYSES CONDUCTED SUBSEQUENT TO THE EARLY**
3 **2011 ANALYSES.**

4 **A.** After the Early 2011 analyses, the Welsh Units 1 and 3 and Pirkey unit disposition
5 analyses were conducted again at various points in time over the next several years.
6 These additional analyses were conducted under updated assumptions around
7 SWEPCO's load forecast, commodity price forecasts, and capital cost assumptions
8 for environmental retrofits and replacement capacity. These analyses were conducted
9 in order to verify that the earlier decision to install the environmental retrofits and
10 continue to operate those units continued to be the most economic course of action for
11 SWEPCO's customers.

12 The Welsh Units 1 and 3 unit disposition analysis was conducted again in
13 Spring 2012, Fall 2012 and Summer 2013 using Strategist®. Prior to Summer 2014,
14 the Company began using the PLEXOS® resource planning model as its production
15 costing and resource planning tool. Additional Welsh unit disposition analyses were
16 also conducted in Summer 2014 and Summer 2015 using PLEXOS®. Additional
17 Pirkey unit disposition analyses using Strategist® were conducted in Spring 2012 and
18 Fall 2012. The PLEXOS® model was used to perform additional Pirkey unit
19 disposition analyses in Summer 2014 and Summer 2015.

20 These additional unit disposition analyses demonstrate that installing the
21 necessary environmental retrofits and operating the respective solid fuel units
22 continued to provide more expected economic benefits than retiring and replacing the

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1 units with either new natural gas CC capacity, or market capacity and energy, or
2 where feasible, installing the equipment required to convert those solid fuel units to
3 natural gas burning units.

4 **III. INTRODUCTION TO THE**
5 **EARLY 2011 UNIT DISPOSITION ANALYSES**

6 **Q. PLEASE DESCRIBE THE PURPOSE OF THIS SECTION OF YOUR**
7 **TESTIMONY.**

8 **A.** The purpose of this section of my testimony is to describe two of the main drivers and
9 assumptions used in the Early 2011 unit disposition analyses. The first key driver in
10 those unit disposition analyses is the CDR analysis that assesses the need for
11 continued operation of those respective disposition units. The second key driver is
12 the forecast of commodity prices that influence a utility's cost to produce electricity.

13 **A. Overview of the CDR Analysis**

14 **Q. PLEASE DESCRIBE THE PURPOSE OF A CDR ANALYSIS.**

15 **A.** A CDR analysis is used to determine the need for generating resources to meet
16 customers' peak demand requirements, including satisfying the SPP minimum
17 capacity margin requirement.

18 **Q. PLEASE DESCRIBE THE SPP MINIMUM CAPACITY MARGIN**
19 **REQUIREMENT.**

20 **A.** At the time these analyses were conducted, the SPP minimum capacity margin
21 requirement was 12%.¹ In other words, a utility must maintain reserve capacity

¹ Per Section 2.1.9 of the April 25, 2011 Southwest Power Pool Criteria document.

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1 (Capacity – Peak Load) of at least 12% above their installed capacity. For example,
 2 if a utility has a capacity of 1,150 megawatts (MW) and a peak load of 1,000 MW, its
 3 capacity reserve would be approximately 13% $((1,150 - 1,000)/1,150)$. As a function
 4 of peak demand, capacity margin converts to a reserve margin of 13.6%².

5 **Q. PLEASE DISCUSS THE CDRs THAT CONTRIBUTED TO THE EARLY 2011**
 6 **ANALYSIS THAT ASSUMES WELSH UNITS 1, 2 AND 3 AND PIRKEY**
 7 **CONTINUE TO OPERATE.**

8 **A.** A CDR presents a company's future capacity position compared to its anticipated
 9 peak load. DIRECT EXHIBIT MAB-1 provides the detailed April 2011 CDR for the
 10 Company that assumes Welsh Units 1, 2 and 3 and Pirkey continue to operate. Table
 11 1 provides a summary of DIRECT EXHIBIT MAB-1.

Table 1										
	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
Capacity Margin (%)	13.7	13.8	19.3	18.6	17.9	17.8	17.4	16.9	16.4	16.4
Reserve Capacity Above SPP 12% Capacity Margin (MW)	108	113	507	458	388	384	357	322	292	290

Note: Includes impact of Commission approved Active and Passive DSM programs

12
 13 **Q. HOW WOULD THE COMPANY'S CAPACITY POSITION BE IMPACTED**
 14 **IF ANY OF THE 528 MW WELSH UNITS, OR 580 MW PIRKEY UNIT WAS**
 15 **TO BE RETIRED DURING THAT TIME PERIOD?**

16 **A.** Table 2 summarizes the Company's reserve capacity above or below the required SPP
 17 capacity margin, if any of the Welsh units or Pirkey unit had been retired in 2011.

² $0.12/(1-0.12)=0.136$

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Table 2 Reserve Capacity Above/(Below) SPP 12% Capacity Margin (MW) Assuming 1/1/2011 Retirement Date										
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Welsh Unit 1, 2, or 3 Retirement (528 MW)	(420)	(415)	(21)	(70)	(140)	(144)	(171)	(206)	(236)	(238)
Pirkey Unit Retirement (580 MW)	(472)	(467)	(73)	(122)	(192)	(196)	(223)	(258)	(288)	(290)
Note Includes impact of Commission approved Active and Passive DSM programs										

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Table 2 shows that if any of the 528 MW Welsh units had been retired in 2011, SWEPCO's reserve capacity would be 21 MW to 420 MW below the SPP capacity margin requirement. If the 580 MW Pirkey unit had been retired, SWEPCO's reserve capacity would be 73 MW to 472 MW below the capacity reserve requirement. This CDR analysis points to the continuing need for Welsh Units 1, 2 and 3 and Pirkey so that SWEPCO can meet its SPP capacity margin requirements. In order to meet this requirement, the installation of the required environmental retrofits would be necessary to allow the continued operation of these solid-fuel units. If the environmental retrofits were not installed and the units were required to retire, the CDR analysis indicates that the capacity of those units would need to be replaced in order to meet the SPP capacity margin requirement.

13

B. Summary of Commodity Price Forecast Assumptions

14

Q. PLEASE DESCRIBE THE ELEMENTS OF A COMMODITY PRICE FORECAST, WHICH IS ANOTHER KEY DRIVER IN THE EARLY 2011 UNIT DISPOSITION ANALYSES.

16

17

A. AEPSC's Fundamental Analysis group develops correlated long-term (e.g. 30 year) forecasts of commodity prices that underlie the costs of producing electricity. Those commodity price forecasts include prices for natural gas, coal, SPP market energy and CO₂ emissions. In developing those commodity price forecasts, the Fundamental

20

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1 Analysis group creates several forecasts that represent a range of potential market
2 conditions. For example, the “Reference,” “Reference Prime” and “Fleet Transition”
3 commodity price forecasts used in the Early 2011 analyses represent the “Base”
4 forecasts that are considered to be the most likely pricing of those commodities at the
5 time the forecasts are developed. A “Low” band commodity price forecast is created
6 that represents pricing that would occur if natural gas prices and SPP market energy
7 prices are depressed in relation to the then existing expectations. In recognition of the
8 potential that some type of CO₂/carbon reduction regulation was possible, each of the
9 “Base” and “Low” Band commodity price forecasts included a price for CO₂
10 emissions from generating units beginning in 2017. In addition, a Path B commodity
11 price forecast was developed that included a higher CO₂ price beginning in 2017. In
12 addition to the base assumption that CO₂ pricing would begin in 2017, commodity
13 price forecasts were developed that varied the timing of the implementation of CO₂
14 prices and the level of CO₂ prices (i.e. CO₂ Sensitivity). The CO₂ commodity price
15 and timing sensitivities included a No CO₂ price forecast that removed CO₂ pricing
16 from the forecast, and a Fleet Transition - Carbon Adjusted price forecast where CO₂
17 prices were implemented in 2022 at prices lower than those of the Fleet Transition
18 commodity price forecast.

19 **Q. PLEASE PROVIDE A CHRONOLOGY OF THE COMMODITY PRICE**
20 **FORECAST UPDATES THAT OCCURRED DURING THE EARLY 2011**
21 **UNIT DISPOSITION ANALYSES.**

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1 **A.** The commodity price forecasts used in the Early 2011 unit disposition analyses were
2 updated twice over the five-month period when these analyses were conducted. The
3 January 2011 analysis used commodity price forecasts (Reference and No CO₂ price)
4 that were developed in late-2010. In January 2011, the commodity price forecasts
5 (Reference Prime, Path B and No CO₂ pricing) were developed and used in the
6 February 2011 through April 2011 analyses. In April 2011, the commodity price
7 forecasts (Fleet Transition, Low Band and Fleet Transition – Carbon Adjusted) were
8 developed and also used in the April 2011 and May 2011 analyses.

9 **Q. PLEASE PROVIDE A COMPARISON OF THE COMMODITY PRICE**
10 **FORECAST BANDS THAT WERE UTILIZED IN THE EARLY 2011 UNIT**
11 **DISPOSITION ANALYSES.**

12 **A.** DIRECT EXHIBIT MAB-2 provides a comparison of the commodity prices assumed
13 in the Early 2011 unit disposition analyses.

14 **IV. OVERVIEW OF THE EARLY 2011**
15 **WELSH UNITS 1, 2 AND 3 UNIT DISPOSITION ANALYSES**

16 **Q. WHEN WERE THE WELSH UNITS 1, 2 AND 3 STRATEGIST®**
17 **DISPOSITION ANALYSES CONDUCTED PRIOR TO THE JUNE 9, 2011**
18 **ANNOUNCEMENT OF SWEPCO'S UNIT DISPOSITION DECISIONS?**

19 **A.** Strategist® Welsh Units 1, 2 and 3 disposition analyses were conducted on a monthly
20 basis from January 2011 through May 2011 prior to the June 9, 2011 press release
21 announcing SWEPCO's Welsh, Flint Creek and Pirkey unit disposition decisions.

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1 **Q. DUE TO THE CONTINUED NEED FOR WELSH UNITS 1, 2 AND UNIT 3**
2 **CAPACITY, WHAT ENVIRONMENTAL RETROFIT OPTIONS WERE**
3 **EVALUATED TO ENABLE CONTINUED LONG-TERM OPERATION OF**
4 **THE UNITS?**

5 **A.** In order to account for the likelihood that some level of SO₂ reductions could be
6 necessary at the Welsh units due to future requirements, SWEPCO evaluated the
7 installation of dry flue-gas desulfurization (DFGD) NIDTM or Dry Sorbent Injection
8 (DSI) retrofits to reduce SO₂ emissions. In addition, selective catalytic reduction
9 (SCR) retrofits were also evaluated in order to meet potential nitrogen oxides (NOx)
10 reduction requirements in the future. Also, as explained by SWEPCO witness
11 Thomas P. Brice, in order to meet the Mercury and Air Toxics Standards (MATS)
12 rule, an Activated Carbon Injection/Bag House (ACIBH) system would need to be
13 installed at the Welsh units to allow their continued operation. In addition to
14 installing those environmental retrofits, it was assumed that other measures (e.g.
15 bottom ash conversion and disposal, waste water treatment facilities, landfill
16 improvements, etc.) would be necessary to meet a Coal Combustion Residuals (CCR)
17 rule.

18 **Q. WHAT TYPE OF REPLACEMENT CAPACITY WAS EVALUATED IF THE**
19 **INSTALLATION OF THE REQUIRED WELSH ENVIRONMENTAL**
20 **RETROFITS WERE NOT PERFORMED AND THE UNIT(S) WERE**
21 **FORCED TO RETIRE?**

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1 A. In order to replace the capacity from retiring Welsh units, it was assumed that
2 SWEPCO would add a new 385 MW combined-cycle (CC) generating unit(s).

3 Q. PLEASE SUMMARIZE THE CAPITAL COSTS OF THE WELSH UNITS 1, 2
4 AND 3 ENVIRONMENTAL RETROFIT OPTIONS AND THE
5 REPLACEMENT CC CAPACITY.

6 A. Table 3 provides a summary of the Welsh Units 1, 2 and 3 environmental retrofit
7 options' capital costs. Table 4 summarizes the capital cost of the replacement CC
8 capacity.

Table 3						
Unit Disposition Analysis Date	Retrofit Capital Cost (\$2011/kW Excluding AFUDC)			Retrofit Capital Cost (As-Spent Excluding AFUDC \$M)		
	Welsh 1	Welsh 2	Welsh 3	Welsh 1	Welsh 2	Welsh 3
January 2011	964	1,024	909	578	613	561
February 2011	964	1,024	909	578	613	561
March 2011	964	1,024	909	578	613	561
April 2011	858	820	843	515	492	520
May 2011	835	860	875	563	589	623

Table 4		
Replacement Capacity Cost Excluding AFUDC (\$2011)		
	<u>\$/kW</u>	<u>\$Million</u>
385 MW CC	1,127	453

10
11 Q. PLEASE SUMMARIZE THE RESULTS OF THE STRATEGIST® UNIT
12 DISPOSITION ANALYSES THAT COMPARED THE VARIOUS WELSH
13 RETROFIT OPTIONS TO THE RETIREMENT OPTIONS UNDER THE
14 RANGE OF COMMODITY PRICE ASSUMPTIONS USED IN THE EARLY
15 2011 UNIT DISPOSITION ANALYSES.

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1 **A.** Table 5 provides a summary of the economics of installing various Welsh Units 1
2 and 3 environmental retrofits versus retirement of the Welsh Units 1 and 3, under the
3 spectrum of commodity price forecasts used in the Early 2011 analyses. These unit
4 disposition options are compared on a Cumulative Present Worth of annual revenue
5 requirements (CPWRR) basis. The CPWRR for each option is the cumulative present
6 worth of the sum of SWEPCO's system energy production costs and recovery of
7 capital expenditures over the 2011 through 2040 time period. Table 5 shows that
8 under all commodity price assumptions but one, the Welsh Units 1 and 3 retrofits
9 CPWRR savings over retirement of all three units ranged between \$182 million and
10 approximately \$1.2 billion.

Table 5				
Welsh 1 and 3				
Retrofit Savings/(Cost) Over Retirement				
(2011-2040 CPWRR \$Million)				
<u>Analysis Date</u>	<u>Path B</u>	<u>Low Band</u>	<u>Base Band</u>	<u>CO₂ Sensitivity</u>
January 2011	-	-	508	921
February 2011	336	-	446	949
March 2011	379	-	403	905
April 2011 ⁽¹⁾	323	{38}	182 - 364	866
May 2011	-	522	773	1,224
Note:				
(1) The April 2011 analysis was conducted under the Reference				
Prime and the Fleet Transition Commodity Price forecasts				
that were both considered to be Base Band forecasts				

11
12 **Q.** **PLEASE SUMMARIZE THE RESULTS OF THE STRATEGIST® UNIT**
13 **DISPOSITION ANALYSES FOR WELSH UNIT 2 THAT COMPARED THE**
14 **VARIOUS WELSH RETROFIT OPTIONS TO THE RETIREMENT**

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1 **OPTIONS UNDER THE RANGE OF COMMODITY PRICE ASSUMPTIONS**
2 **USED IN THE EARLY 2011 UNIT DISPOSITION ANALYSES.**
3 **A.** Table 6 provides a summary of the economics of installing the various Welsh Unit 2
4 environmental retrofits versus retirement of the unit, under the range of commodity
5 price forecasts used in the Early 2011 unit disposition analyses. Unlike the Welsh
6 Units 1 and 3 unit disposition analyses results, the Welsh Unit 2 analyses shows that
7 under several of the commodity price forecast assumptions, it is more economical to
8 retire the unit than retrofit the unit. For example, under 7 of the 16 analyses results,
9 retrofitting Welsh 2 produces higher CPWRR cost values than retiring the unit.
10 Those increased CPWRR costs range from \$8 million to \$146 million.

Table 6				
Welsh 2				
Retrofit Savings/(Cost) Over Retirement				
(2011-2040 CPWRR \$Million)				
	<u>Path B</u>	<u>Low Band</u>	<u>Base Band ⁽¹⁾</u>	<u>CO₂ Sensitivity</u>
January 2011	-	-	(23)	265
February 2011	(24)	-	55	279
March 2011	(8)	-	35	259
April 2011 ⁽¹⁾	31	(119)	(21) - 85	310
May 2011	-	(146)	(37)	161
Note:				
(1) The April 2011 analysis was conducted under the Reference				
Prime and the Fleet Transition Commodity Price forecasts				
that were both considered to be Base Band forecasts				

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A. Strategist® Pirkey disposition analyses were conducted on a monthly basis from January 2011 through May 2011 prior to the June 9, 2011 press release announcing SWEPCO's Welsh, Flint Creek and Pirkey unit disposition decisions.

A. At the time the analyses were conducted, in order to meet the MATS rule, a BH system would need to be installed at the Pirkey unit to allow its continued operation. While not required at the time, an SCR was also assumed to be installed in order to meet potential NO_x emission reduction requirements in the future. In addition to installing those environmental retrofits, it was assumed that other measures (e.g. bottom ash conversion and disposal, waste water treatment facilities landfill improvements, etc.) would be necessary to meet a CCR rule.

Q. WHAT TYPE OF REPLACEMENT CAPACITY WAS EVALUATED IF THE INSTALLATION OF THE REQUIRED PIRKEY ENVIRONMENTAL RETROFITS WAS NOT PERFORMED AND THE UNIT WAS FORCED TO RETIRE?

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1 A. In order to replace the capacity from the retiring Pirkey unit, it was assumed that
2 SWEPCO would add a new 600 MW CC unit.

3 Q. PLEASE SUMMARIZE THE CAPITAL COSTS OF THE PIRKEY
4 RETROFIT OPTIONS AND THE REPLACEMENT CC CAPACITY.

5 A. Table 7 provides a summary of the Pirkey environmental retrofit options. Table 8
6 summarizes the capital cost of the replacement CC capacity.

Table 7		
Unit Disposition	Pirkey Retrofit Capital Cost	Pirkey Retrofit Capital Cost
<u>Analysis Date</u>	<u>(\$2011/kW Excluding AFUDC)</u>	<u>(As-Spent Excluding AFUDC \$M)</u>
January 2011	451	296
February 2011	451	296
March 2011	451	296
April 2011	349	229
May 2011	349	229

Table 8		
Pirkey Replacement Capacity Cost Excluding AFUDC (2011\$)		
	<u>\$/kW</u>	<u>\$Million</u>
600 MW CC	985	591

8
9 Q. PLEASE SUMMARIZE THE RESULTS OF THE STRATEGIST® UNIT
10 DISPOSITION ANALYSES THAT COMPARED THE VARIOUS PIRKEY
11 RETROFIT OPTIONS TO THE RETIREMENT OPTIONS UNDER THE
12 RANGE OF COMMODITY PRICE ASSUMPTIONS USED IN THE EARLY
13 2011 UNIT DISPOSITION ANALYSES.

14 A. Table 9 provides a summary of the economics of installing various Pirkey
15 environmental retrofits versus retirement under the range of commodity price

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1 forecasts used in the Early 2011 unit disposition analyses. Table 9 shows that under
2 all commodity price assumptions, the Pirkey retrofit CPWRR savings over retirement
3 ranged between \$67 million and approximately \$729 million.

Table 9				
Pirkey				
Retrofit Savings/(Cost) Over Retirement (2011-2040 CPWRR \$Million)				
	<u>Path B</u>	<u>Low Band</u>	<u>Base Band ⁽¹⁾</u>	<u>CO₂ Sensitivity</u>
January 2011	-	-	276	587
February 2011	472	-	388	729
March 2011	490	-	350	691
April 2011 ⁽¹⁾	476	74	221 - 362	703
May 2011	-	67	-	406
Note:				
(1) The April 2011 analysis was conducted under the Reference Prime and the Fleet Transition Commodity Price forecasts that were both considered to be Base Band forecasts				

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5 **Q. AS THE COMPANY CONTINUED TO PERFORM UNIT DISPOSITION**
6 **ANALYSES AFTER EARLY 2011, WERE ERRORS DISCOVERED IN THE**
7 **EARLY 2011 WELSH UNITS 1, 2 AND 3, FLINT CREEK AND PIRKEY**
8 **UNIT DISPOSITION ANALYSES?**

9 **A.** Yes. Those errors were corrected in the unit disposition analyses that occurred
10 subsequent to the Early 2011 unit disposition analyses. Those subsequent analyses
11 continued to indicate that the retrofit of Welsh Units 1 and 3, Flint Creek and Pirkey
12 were economically reasonable choices.

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1 **Q. WERE ANY OF THE EARLY 2011 UNIT DISPOSITION ANALYSES RERUN**
2 **WITH THOSE ERRORS CORRECTED TO PROVE THAT THE ORIGINAL**
3 **RELATIVE RANKING OF UNIT DISPOSITION ALTERNATIVES WAS**
4 **REASONABLE?**

5 **A.** Yes. While developing my testimony, I have rerun the May 2011 unit disposition
6 analyses with these errors corrected and, while the magnitude of the benefits of any
7 given unit disposition option have changed slightly, the relative rankings of the
8 options evaluated has not changed from the original May 2011 analyses. As an
9 example, the original May 2011 Welsh unit disposition analysis performed under
10 Fleet Transition (Base) and Low Band commodity price forecasts indicated that the
11 option which assumes Welsh Units 1 and 3 are retrofit and retires Welsh 2 (i.e.
12 Welsh 2 Retirement Option) produced a range of CPWRR savings of \$37 million to
13 \$146 million over the option which assumes Welsh Units 1, 2 and 3 are retrofit
14 (i.e. Welsh 2 Retrofit Option). The corrected analysis indicates that the range of
15 CPWRR savings of the Welsh 2 Retirement Option over Welsh 2 Retrofit Option has
16 increased slightly from \$50 million to \$162 million. Under Fleet Transition – Carbon
17 Adjusted commodity pricing, the Welsh 2 Retrofit Option continues to produce
18 savings over the Welsh 2 Retirement Option, but those savings have decreased
19 slightly from \$161 million under the original May 2011 analysis to \$144 million
20 under the corrected analysis. Table 10 summarizes the range of Welsh Units 1 and 3
21 and Pirkey retrofit savings compared to unit retirement and CC replacement for the
22 original May 2011 and the corrected May 2011 unit disposition analyses.

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Table 10		
Range of Retrofit Savings over Retirement and CC Replacement 2011-2040 CPWRR (\$Million)		
	Original May 2011 <u>Analyses</u>	Corrected May 2011 <u>Analyses</u>
Welsh Unit 1 and 3	522 - 773	543 - 788
Pirkey	67 - 406	74 - 418

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VI. SUMMARY OF UNIT DISPOSITION
ANALYSES CONDUCTED AFTER THE EARLY 2011 ANALYSES

4

Q. DID THE COMPANY CONTINUE TO EVALUATE THE WELSH UNITS 1 AND 3 AND PIRKEY UNIT DISPOSITION ALTERNATIVES AFTER THE EARLY 2011 ANALYSES?

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A. Yes. The Company performed unit disposition analyses on Welsh Units 1 and 3 in Spring 2012, Fall 2012, Summer 2013, Summer 2014 and Summer 2015. Unit disposition analyses were conducted again on the Pirkey unit in Spring 2012, Fall 2012, Summer 2014 and Summer 2015.

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Q. DID THE COMPANY UPDATE THE COMMODITY PRICE FORECASTS USED FOR THE WELSH UNITS 1 AND 3 AND PIRKEY UNIT DISPOSITION ANALYSES CONDUCTED AFTER THE EARLY 2011 ANALYSES?

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A. Yes. The Spring 2012 and Fall 2012 Welsh Units 1 and 3 and Pirkey unit disposition analyses were also performed under the commodity prices developed in Fall 2011. The Summer 2013 Welsh Units 1 and 3 unit disposition analysis was performed using the Fall 2011 Low Band commodity price forecast. The Summer 2014 and Summer

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1 2015 Welsh Units 1 and 3 and Pirkey unit disposition analyses were performed using
2 the commodity price forecast developed in Fall 2013, and a commodity price forecast
3 that was developed in Summer 2014 in response to the proposed Clean Power Plan.
4 DIRECT EXHIBIT MAB-3 provides a comparison of the commodity prices assumed
5 in the unit disposition analyses conducted after Early 2011.

6 **Q. WHAT DID THE RESULTS OF THE ADDITIONAL WELSH UNITS 1 AND 3**
7 **UNIT DISPOSITION ANALYSES INDICATE?**

8 **A.** All of the additional analyses continued to suggest that installing the necessary
9 environmental retrofits and continuing to operate the units was less costly than
10 retiring and replacing the units with CC capacity and/or converting those units to gas
11 burning facilities where possible. Table 11 provides a summary of the range of
12 Welsh Units 1 and 3 retrofit savings over the retirement and replacement options for
13 the various analyses conducted subsequent to the Early 2011 analyses.

Table 11		
Range of Welsh 1&3 Retrofit Savings over Unit Retirement and Replacement		
	Low Range	High Range
<u>Analysis Date</u>	<u>(\$M)</u>	<u>(\$M)</u>
Spring 2012	365	980
Fall 2012	480	880
Summer 2013	270	570
Summer 2014	320	940
Summer 2015	245	1,000

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1 **Q. WHAT DID THE RESULTS OF THE ADDITIONAL PIRKEY UNIT**
2 **DISPOSITION ANALYSES INDICATE?**

3 **A.** The unit disposition analyses conducted again on the Pirkey unit in Spring 2012, Fall
4 2012, Summer 2014 and Summer 2015 continued to indicate that installing
5 environmental retrofits on Pirkey was more economic than retiring and replacing the
6 unit. Table 12 provides a summary of the range of Pirkey retrofit savings over the
7 retirement and replacement options for the various analyses conducted subsequent to
8 the Early 2011 analyses.

Table 12		
Range of Pirkey Retrofit Savings over Unit Retirement and Replacement		
	Low Range	High Range
<u>Analysis Date</u>	<u>(\$M)</u>	<u>(\$M)</u>
Spring 2012	414	497
Fall 2012	445	530
Summer 2014	450	930
Summer 2015	350	940

9
10 **Q. PLEASE SUMMARIZE THE RESULTS OF THE VARIOUS UNIT**
11 **DISPOSITION ANALYSES CONDUCTED BY THE COMPANY OVER THE**
12 **LAST SEVERAL YEARS.**

13 **A.** My testimony has shown that with the exception of the Company's decision to retire
14 Welsh Unit 2, the Company's decision to install the necessary environmental retrofits
15 and continuing to operate the respective solid fuel units is more economic than
16 retiring and replacing the units with either new natural gas CC capacity, or market

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- 1 capacity and energy, or where feasible, installing the equipment required to convert
2 those solid fuel units to natural gas burning units.

3 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

4 **A.** Yes, it does.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Direct Testimony was electronically served upon all parties of record via the Commission's EFS system on this 28th of February 2019.

/s/ Stephen K. Cuffman
Stephen K. Cuffman

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Direct Exhibit MAB-1 SWEPCO CDR for EARLY 2011 Analyses										
	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
Projected Peak Demand (MW)	5,214	5,288	5,389	5,440	4,715	4,736	4,771	4,804	4,832	4,846
- DSM & DR Impacts (MW)	84	103	110	115	120	124	127	130	132	133
- AEP West Load Diversity (MW)	29	29	28	28	30	30	31	32	32	32
+ Sales with Reserves (MW)	46	48	48	48	248	248	248	250	250	250
- Purchases with Reserves (MW)	<u>339</u>	<u>341</u>	<u>344</u>	<u>346</u>	<u>73</u>	<u>73</u>	<u>73</u>	<u>73</u>	<u>73</u>	<u>73</u>
Load Responsibility (MW) (A)	4,808	4,864	4,955	4,999	4,739	4,757	4,788	4,819	4,845	4,858
Owned Generating Capability (MW)	5,273	5,273	5,720	5,720	5,730	5,730	5,730	5,730	5,730	5,730
- Sales without Reserves (MW)	87	18	18	18	18	18	18	18	18	18
+ Purchases without Reserves (MW)	<u>385</u>	<u>385</u>	<u>436</u>	<u>436</u>	<u>62</u>	<u>78</u>	<u>86</u>	<u>86</u>	<u>86</u>	<u>98</u>
Total Capability (MW) (B)	5,571	5,640	6,138	6,138	5,774	5,790	5,798	5,798	5,798	5,810
Reserve Capacity (MW) (C) = (B) - (A)	763	776	1,183	1,139	1,035	1,033	1,010	979	953	952
Reserve Margin (%) (D) = (B)/(A) - 1	15.9	16.0	23.9	22.8	21.8	21.7	21.1	20.3	19.7	19.6
Capacity Margin (%) (E) = (C)/(B)	13.7	13.8	19.3	18.6	17.9	17.8	17.4	16.9	16.4	16.4
Reserve Capacity Above/(Below)										
SPP 12% Capacity Margin (MW) (F) = (B) - [(A)/(1-.12)]	108	113	507	458	388	384	357	322	292	290

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Direct Exhibit MAB-2
Commodity Price Forecast for Early 2011 Analysis

Analysis Forecast Release Date	SPP On-Peak Energy (\$/MWh)							
	January 2011 Late 2010		February 2011 - April 2011 January 2011			April 2011 - May 2011 April 2011		
	Reference	No CO2	No CO2			Fleet Transition -		
Forecast Name	(Base)	Price	Reference Prime	Path B	Price	Fleet Transition (Base)	Low Band	Carbon Adjusted
2011	43 02	46 85	41 39	43 38	46 85	43 09	42 96	42 74
2012	49 67	57 08	49 65	50 11	57 08	44 85	44 65	45 31
2013	52 88	64 98	53 07	52 77	64 98	49 40	49 45	49 85
2014	56 32	66 06	56 95	60 25	66 06	53.41	53.88	54 37
2015	59 03	69 62	59 01	62 41	69 62	55 21	54 91	55 75
2016	63 86	73 91	64 84	68 39	73 91	58 08	58 14	58.60
2017	73 86	82 35	75 42	79 08	82 35	69 10	70 28	59 00
2018	76 19	84 87	75 95	81 90	84 87	71 16	69 94	59 07
2019	78 31	85 83	77 06	84 69	85 83	71 08	67 61	60 87
2020	77 76	88 38	78 07	85 79	88 38	70 69	67 70	61 17
2021	78 91	89 11	78 77	87 37	89 11	72 31	68 93	62 13
2022	79 60	89 47	79 27	88 26	89 47	72 64	70 23	70 17
2023	81 34	87 37	81 01	91 12	87 37	74 30	70 17	70 68
2024	82 55	82 80	82 31	92 72	82 80	75 50	70 99	71 90
2025	83 76	85 89	84 06	94 91	85 89	75.91	72 49	73 17
2026	84 08	87 64	85 05	96 51	87 64	77 36	72.26	73 67
2027	86 01	90 01	86 76	98 06	90 01	78 47	73 80	75 50
2028	87 01	92 28	88 24	99 60	92 28	80 18	75 38	77 13
2029	88 35	94 41	89 57	101 25	94 41	81 68	76 67	77 71
2030	90 72	97 08	91 54	103 39	97 08	82 84	77 12	79 25
2031	92 18	99 49	93 11	105.18	99 49	84 30	78 08	80 53
2032	93 67	101 95	94 71	107 00	101 95	85.79	79.06	81.83
2033	95 18	104 48	96 34	108.84	104 48	87 30	80 05	83 14
2034	96 72	107 07	98 00	110 72	107 07	88 84	81 05	84 48
2035	98 28	109 73	99 68	112 63	109 73	90 40	82 06	85 85
2036	99 86	112 45	101 40	114 58	112 45	92 00	83 09	87 23
2037	101 47	115 24	103 14	116 56	115 24	93 62	84.13	88.64
2038	103 11	118 10	104 91	118 57	118 10	95 27	85 18	90 07
2039	104 77	121 03	106.71	120.62	121 03	96 95	86 25	91 52
2040	106.46	124 03	108.55	122 70	124 03	98 66	87 33	92 99

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Direct Exhibit MAB-2
Commodity Price Forecast for Early 2011 Analysis

Analysis Forecast Release Date Forecast Name	SPP Off-Peak Energy (\$/MWh)							
	January 2011 Late 2010		February 2011 - April 2011 January 2011			April 2011 - May 2011 April 2011		
	Reference (Base)	No CO2 Price	Reference Prime	Path B	No CO2 Price	Fleet Transition (Base)	Low Band	Fleet Transition - Carbon Adjusted
2011	29.21	31.21	28.04	28.95	31.21	29.05	28.59	28.66
2012	32.93	38.23	33.01	32.97	38.23	30.17	30.14	30.23
2013	35.55	43.37	36.27	35.68	43.37	33.97	33.88	34.21
2014	38.69	44.80	39.24	41.53	44.80	37.08	37.19	37.30
2015	40.45	47.15	40.94	44.26	47.15	38.70	38.18	38.77
2016	43.67	50.05	44.27	51.04	50.05	40.90	40.61	40.70
2017	55.89	56.98	56.05	65.39	56.98	54.00	53.76	40.40
2018	57.15	60.14	58.02	67.66	60.14	55.40	54.47	41.35
2019	59.46	62.27	59.06	70.65	62.27	56.19	53.90	43.16
2020	59.65	64.90	60.61	71.73	64.90	57.42	54.81	44.05
2021	60.49	64.75	61.57	73.63	64.75	58.96	56.64	45.53
2022	61.13	65.91	62.98	74.61	65.91	59.68	57.83	54.59
2023	62.37	65.46	64.05	76.48	65.46	60.56	57.84	56.02
2024	64.13	63.09	65.79	78.31	63.09	61.77	58.52	57.19
2025	65.23	65.23	67.56	79.76	65.23	63.33	60.04	58.78
2026	66.36	68.38	68.72	81.04	68.38	64.80	60.50	59.36
2027	67.88	71.75	70.43	82.66	71.75	66.01	61.78	61.02
2028	69.21	74.62	71.71	83.66	74.62	67.32	64.34	62.87
2029	71.14	77.55	73.12	85.77	77.55	68.99	64.35	63.70
2030	72.75	80.44	75.16	87.32	80.44	70.11	65.00	65.23
2031	74.35	83.88	76.78	88.92	83.88	71.55	66.05	66.60
2032	75.99	87.48	78.44	90.55	87.48	73.02	67.11	68.01
2033	77.67	91.22	80.13	92.20	91.22	74.52	68.19	69.44
2034	79.38	95.13	81.86	93.89	95.13	76.05	69.29	70.90
2035	81.13	99.20	83.62	95.61	99.20	77.62	70.40	72.40
2036	82.92	103.45	85.42	97.36	103.45	79.21	71.54	73.92
2037	84.75	107.88	87.27	99.14	107.88	80.84	72.69	75.48
2038	86.62	112.50	89.15	100.95	112.50	82.50	73.86	77.07
2039	88.53	117.32	91.07	102.80	117.32	84.20	75.05	78.70
2040	90.49	122.34	93.04	104.68	122.34	85.93	76.26	80.36

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Direct Exhibit MAB-2
Commodity Price Forecast for Early 2011 Analysis

Analysis Forecast Release Date	Henry Hub Gas Price (\$/MMBtu)							
	January 2011 Late 2010		February 2011 - April 2011 January 2011			April 2011 - May 2011 April 2011		
	Reference	No CO2				Fleet Transition		Fleet Transition -
Forecast Name	(Base)	Price	Reference Prime	Path B	No CO2 Price	(Base)	Low Band	Carbon Adjusted
2011	4.21	4.81	4.21	4.21	4.81	4.13	4.13	4.13
2012	4.87	5.83	4.87	4.87	5.83	4.19	4.19	4.21
2013	5.14	6.78	5.14	5.14	6.78	4.70	4.70	4.71
2014	5.44	7.02	5.44	5.76	7.02	5.06	5.06	5.06
2015	5.65	7.48	5.65	6.29	7.48	5.20	5.20	5.20
2016	6.06	8.01	6.12	7.01	8.01	5.41	5.41	5.41
2017	6.24	9.09	6.30	7.19	9.09	5.56	5.56	5.44
2018	6.58	9.47	6.64	7.53	9.47	6.07	5.49	5.68
2019	6.84	9.65	6.98	7.79	9.65	6.29	5.59	5.89
2020	7.00	10.02	7.14	7.95	10.02	6.45	5.75	6.06
2021	7.18	10.15	7.40	8.13	10.15	6.68	5.96	6.28
2022	7.28	10.25	7.50	8.23	10.25	6.81	6.12	6.54
2023	7.53	10.00	7.75	8.48	10.00	6.99	6.23	6.73
2024	7.83	9.37	8.07	8.78	9.37	7.22	6.38	6.95
2025	8.00	9.70	8.32	8.95	9.70	7.43	6.55	7.16
2026	8.16	9.94	8.49	9.11	9.94	7.55	6.61	7.25
2027	8.33	10.19	8.66	9.28	10.19	7.71	6.75	7.42
2028	8.50	10.45	8.84	9.45	10.45	7.87	6.89	7.58
2029	8.66	10.71	9.01	9.61	10.71	8.06	7.12	7.75
2030	8.84	10.97	9.19	9.79	10.97	8.16	7.13	7.86
2031	9.02	11.24	9.38	9.97	11.24	8.31	7.25	8.01
2032	9.20	11.52	9.57	10.15	11.52	8.47	7.38	8.16
2033	9.39	11.81	9.76	10.33	11.81	8.63	7.50	8.31
2034	9.58	12.10	9.96	10.52	12.10	8.80	7.63	8.47
2035	9.77	12.41	10.16	10.71	12.41	8.96	7.76	8.63
2036	9.97	12.72	10.37	10.91	12.72	9.13	7.90	8.79
2037	10.17	13.03	10.58	11.11	13.03	9.30	8.03	8.96
2038	10.38	13.36	10.79	11.31	13.36	9.48	8.17	9.13
2039	10.59	13.69	11.01	11.51	13.69	9.66	8.31	9.30
2040	10.80	14.03	11.23	11.72	14.03	9.84	8.45	9.47

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PRB 8800 Btu/lb 0.8 #SO2 (FOB\$/Ton)								
Analysis Forecast Release Date	January 2011 Late 2010		February 2011 - April 2011 January 2011			April 2011 - May 2011 April 2011		
Forecast Name	Reference (Base)	No CO2 Price	Reference Prime	Path B	No CO2 Price	Fleet Transition (Base)	Low Band	Fleet Transition - Carbon Adjusted
2011	14 00	13 50	14 00	14 00	13 50	13 85	14 00	13 85
2012	14 50	14 50	14 75	14 50	14 50	14 80	14 75	14 80
2013	14 91	15 50	15 25	14 91	15 50	15 55	15 25	15 55
2014	15 41	15 83	15 57	14 82	15 83	15 61	15 61	15 61
2015	15 90	16 20	15 90	14 73	16 20	15 95	15 95	15 99
2016	16 12	16 57	16 12	14 64	16 57	16 29	16 29	16 37
2017	16 05	16 97	16 05	14 95	16 97	16 60	16 60	16 76
2018	16 27	17 37	16 27	15 27	17 37	16 91	16 91	17 16
2019	16 62	17 79	16 62	15 60	17 79	17 23	17 23	17 57
2020	17 51	18 22	17 51	15 93	18 22	17 55	17 55	17 99
2021	17 88	18 67	17 88	16 26	18 67	17 88	17 88	18 41
2022	18 26	19 14	18 26	16 60	19 14	18 21	18 21	18 47
2023	18 54	19 51	18 54	16 87	19 51	18 54	18 54	18 90
2024	18 84	19 89	18 84	17 13	19 89	18 88	18 88	19 34
2025	19 13	20 27	19 13	17 39	20 27	19 22	19 22	19 78
2026	19 42	20 66	19 42	17 66	20 66	19 56	19 56	20 24
2027	19 71	21 05	19 71	17 93	21 05	19 90	19 90	20 70
2028	20 01	21 45	20 01	18 20	21 45	20 25	20 25	21 16
2029	20 31	21 85	20 31	18 47	21 85	20 61	20 61	21 64
2030	20 62	22 27	20 62	18 75	22 27	20 97	20 97	22 13
2031	20 93	22 69	20 93	19 03	22 69	21 34	21 34	22 63
2032	21 24	23 12	21 24	19 32	23 12	21 71	21 71	23 15
2033	21 57	23 56	21 57	19 61	23 56	22 10	22 10	23 67
2034	21 89	24 01	21 89	19 91	24 01	22 48	22 48	24 21
2035	22 22	24 47	22 22	20 21	24 47	22 88	22 88	24 76
2036	22 56	24 93	22 56	20 52	24 93	23 28	23 28	25 32
2037	22 90	25 41	22 90	20 83	25 41	23 69	23 69	25 90
2038	23 25	25 89	23 25	21 14	25 89	24 11	24 11	26 48
2039	23 60	26 38	23 60	21 46	26 38	24 53	24 53	27 09
2040	23 95	26 88	23 95	21 79	26 88	24 96	24 96	27 70

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Commodity Price Forecast for Early 2011 Analysis

Analysis Forecast Release Date	CO2 Price (\$/Metric Tonne)							
	January 2011 Late 2010		February 2011 - April 2011 January 2011			April 2011 - May 2011 April 2011		
	Reference (Base)	No CO2 Price	Reference Prime	Path B	No CO2 Price	Fleet Transition (Base)	Low Band	Fleet Transition - Carbon Adjusted
Forecast Name								
2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2017	18.74	0.00	18.74	29.76	0.00	18.74	18.74	0.00
2018	19.84	0.00	19.84	30.86	0.00	19.84	19.84	0.00
2019	20.94	0.00	20.94	31.97	0.00	20.94	20.94	0.00
2020	22.05	0.00	22.05	33.07	0.00	22.05	22.05	0.00
2021	22.33	0.00	22.33	33.50	0.00	22.33	22.33	0.00
2022	22.62	0.00	22.62	33.94	0.00	22.62	22.62	15.08
2023	22.92	0.00	22.92	34.38	0.00	22.92	22.92	15.28
2024	23.21	0.00	23.21	34.82	0.00	23.21	23.21	15.48
2025	23.51	0.00	23.51	35.27	0.00	23.51	23.51	15.67
2026	23.82	0.00	23.82	35.74	0.00	23.82	23.82	15.88
2027	24.13	0.00	24.13	36.20	0.00	24.13	24.13	16.08
2028	24.45	0.00	24.45	36.67	0.00	24.45	24.45	16.29
2029	24.77	0.00	24.77	37.15	0.00	24.77	24.77	16.50
2030	25.07	0.00	25.07	37.59	0.00	25.07	25.07	16.72
2031	25.39	0.00	25.39	38.07	0.00	25.39	25.39	16.94
2032	25.72	0.00	25.72	38.56	0.00	25.72	25.72	17.16
2033	26.05	0.00	26.05	39.05	0.00	26.05	26.05	17.38
2034	26.38	0.00	26.38	39.55	0.00	26.38	26.38	17.61
2035	26.72	0.00	26.72	40.06	0.00	26.72	26.72	17.84
2036	27.07	0.00	27.07	40.57	0.00	27.07	27.07	18.07
2037	27.42	0.00	27.42	41.09	0.00	27.42	27.42	18.31
2038	27.77	0.00	27.77	41.61	0.00	27.77	27.77	18.55
2039	28.13	0.00	28.13	42.14	0.00	28.13	28.13	18.79
2040	28.49	0.00	28.49	42.68	0.00	28.49	28.49	19.04

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Commodity Price Forecast for Post-2011 Analysis

SPP On-Peak Energy (\$/MWh)						
Analysis	Spring 2012 and Fall 2012 Welsh 1 and 3 and Pirkey, Summer 2013 Welsh 1 and 3		Summer 2014 and 2015 Welsh 1 and 3 and Pirkey			
Forecast Release Date	Fall 2011	Fall 2011	Fall 2013	Summer 2014	Summer 2014	Summer 2014
Forecast Name	Fleet Transition - CSAPR (Base Band)	Fleet Transition - CSAPR (Low Band)	Fleet Transition (Base Band)	CPP with \$15-\$25/ton CO2 Price	CPP with \$25-\$40/ton CO2 Price	CPP with No CO2 Price
2012	47.39	44.20				
2013	50.77	45.32	34.02			
2014	55.73	47.48	41.16			
2015	59.20	52.72	47.93	44.52	43.89	48.48
2016	64.97	57.34	53.00	48.60	47.60	53.30
2017	65.75	58.54	55.91	51.59	50.33	55.46
2018	66.64	59.56	56.96	53.61	52.16	57.04
2019	67.85	61.41	58.35	55.56	54.69	58.73
2020	66.87	62.52	60.60	61.94	69.65	60.81
2021	68.52	64.48	64.14	65.65	73.04	63.70
2022	75.69	73.29	71.59	67.21	75.00	64.02
2023	76.53	74.03	73.41	68.65	76.39	66.00
2024	78.76	75.36	76.11	71.64	78.93	68.17
2025	80.50	76.45	78.77	74.10	81.63	70.52
2026	81.13	77.12	79.76	75.24	83.47	73.23
2027	83.15	78.22	82.49	78.20	86.79	75.37
2028	84.15	79.06	84.68	81.38	88.68	77.34
2029	85.57	80.45	86.60	83.62	91.01	79.83
2030	86.60	81.44	89.22	90.66	100.19	81.16
2031	87.88	82.48	91.67	93.58	103.83	84.12
2032	89.17	83.53	95.35	96.39	107.99	86.83
2033	90.48	84.59	97.29	97.68	110.58	89.67
2034	91.82	85.67	91.11	99.21	111.39	84.72
2035	93.17	86.76	94.28	101.01	112.91	87.97
2036	94.54	87.86	95.40	101.70	113.30	89.40
2037	95.94	88.98	96.53	102.40	115.77	90.50
2038	97.35	90.11	97.67	103.80	116.24	91.25
2039	98.78	91.26	98.83	104.42	117.66	91.57
2040	100.24	92.42	100.00	105.98	119.07	93.00

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Commodity Price Forecast for Post-2011 Analysis

SPP Off-Peak Energy (\$/MWh)						
Analysis	Spring 2012 and Fall 2012 Welsh 1 and 3 and Pirkey.		Summer 2014 and 2015 Welsh 1 and 3 and Pirkey			
Forecast Release Date	Fall 2011	Fall 2011	Fall 2013	Fall 2013	Summer 2014	Summer 2014
Forecast Name	Fleet Transition - CSAPR (Base Band)	Fleet Transition - CSAPR (Low Band)	Fleet Transition (Base Band)	CPP with \$15- \$25/ton CO2 Price	CPP with \$25- \$40/ton CO2 Price	CPP with No CO2 Price
2012	32.63	30.57				
2013	34.86	31.98	23.50			
2014	39.00	33.74	26.95			
2015	41.78	36.92	30.98	28.12	28.33	32.24
2016	46.15	40.69	35.50	30.76	30.88	36.08
2017	47.70	42.41	37.99	32.58	32.65	38.53
2018	48.97	42.86	39.47	34.11	34.38	40.15
2019	49.75	44.68	41.11	36.06	36.33	41.74
2020	48.80	45.35	43.05	46.93	55.49	43.58
2021	50.78	47.58	45.34	49.15	57.93	45.21
2022	59.13	56.07	54.52	50.09	59.06	45.19
2023	60.17	56.36	55.90	51.39	60.18	47.12
2024	62.40	58.28	57.84	53.27	62.16	49.13
2025	63.83	59.71	59.67	55.29	63.87	50.60
2026	64.33	60.67	61.29	56.58	65.45	52.31
2027	66.12	61.68	63.15	58.67	67.83	54.34
2028	67.56	63.01	64.68	60.70	69.87	55.56
2029	69.56	64.32	66.55	63.15	71.53	57.73
2030	70.45	64.81	68.29	69.78	81.08	59.19
2031	71.86	65.88	70.46	72.76	83.80	61.06
2032	73.29	66.97	73.61	75.49	87.43	63.98
2033	74.75	68.08	75.30	77.11	90.24	66.24
2034	76.25	69.21	72.19	79.44	92.66	65.29
2035	77.77	70.35	74.87	81.10	94.35	67.74
2036	79.32	71.51	76.30	81.75	94.90	69.59
2037	80.91	72.70	77.75	83.23	97.02	71.43
2038	82.52	73.90	79.23	84.97	98.54	73.02
2039	84.17	75.12	80.74	86.63	99.90	74.46
2040	85.85	76.36	82.28	87.98	102.30	76.44

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Commodity Price Forecast for Post-2011 Analysis

Henry Hub Gas Price (\$/MMBtu)						
Analysis	Spring 2012 and Fall 2012 Welsh 1 and 3 and Pirkey.		Summer 2014 and 2015 Welsh 1 and 3 and Pirkey			
Forecast Release Date	Fall 2011	Spring 2012	Fall 2013	Spring 2014	Summer 2014	
Forecast Name	Fleet Transition - CSAPR (Base Band)	Fleet Transition - CSAPR (Low Band)	Fleet Transition (Base Band)	CPP with \$15- \$25/ton CO2 Price	CPP with \$25- \$40/ton CO2 Price	CPP with No CO2 Price
2012	4.48	3.94				
2013	4.94	4.35	4.04			
2014	5.38	4.73	5.05			
2015	5.52	4.86	5.47	5.47	5.41	5.45
2016	5.99	5.27	5.83	5.83	5.76	5.81
2017	6.13	5.39	6.01	6.01	5.93	5.99
2018	6.32	5.56	6.12	6.12	6.05	6.10
2019	6.46	5.68	6.19	6.19	6.11	6.17
2020	6.52	5.73	6.43	6.82	6.66	6.41
2021	6.75	5.94	6.75	7.16	6.98	6.62
2022	7.07	6.22	7.18	7.54	7.29	6.81
2023	7.26	6.39	7.30	7.67	7.42	7.00
2024	7.51	6.61	7.51	7.88	7.63	7.19
2025	7.75	6.82	7.75	8.13	7.87	7.40
2026	7.85	6.91	7.85	8.24	7.99	7.61
2027	8.04	7.08	8.04	8.44	8.20	7.80
2028	8.22	7.23	8.22	8.63	8.37	7.97
2029	8.41	7.40	8.41	8.83	8.56	8.15
2030	8.52	7.50	8.52	9.55	9.17	8.27
2031	8.68	7.64	8.73	9.78	9.40	8.47
2032	8.85	7.79	8.94	10.01	9.63	8.67
2033	9.02	7.94	9.16	10.26	9.82	8.89
2034	9.19	8.09	9.39	10.52	10.07	9.11
2035	9.37	8.25	9.61	10.76	10.29	9.32
2036	9.55	8.41	9.84	10.96	10.48	9.55
2037	9.73	8.57	10.08	11.15	10.66	9.78
2038	9.92	8.73	10.33	11.35	10.86	10.02
2039	10.10	8.90	10.58	11.56	11.05	10.26
2040	10.30	9.07	10.84	11.77	11.25	10.51

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PRB 8800 Btu/lb 0.8 #SO2 (FOB\$/Ton)						
Analysis	Spring 2012 and Fall 2012 Welsh 1 and 3 and Pirkey.		Summer 2014 and 2015 Welsh 1 and 3 and Pirkey			
Forecast Release Date	Summer 2013 Welsh 1 and 3 Fall 2013		Fall 2013	Summer 2014		
Forecast Name	Fleet Transition - CSAPR (Base Band)	Fleet Transition - CSAPR (Low Band)	Fleet Transition (Base Band)	CPP with \$15- \$25/ton CO2 Price	CPP with \$25- \$40/ton CO2 Price	CPP with No CO2 Price
2012	15.75	14.49				
2013	16.95	15.26	11.25			
2014	17.50	15.75	12.50			
2015	17.50	15.40	13.50	13.50	13.50	13.60
2016	17.40	15.31	13.20	13.20	13.20	13.30
2017	17.30	15.22	13.44	13.44	13.44	13.54
2018	17.72	15.59	13.68	13.68	13.68	13.78
2019	18.14	15.96	14.42	14.42	14.42	14.53
2020	18.57	16.34	15.49	14.72	15.49	15.61
2021	19.00	16.72	15.44	14.67	15.44	15.56
2022	19.07	16.78	16.36	15.71	16.36	16.69
2023	19.51	17.17	16.97	16.29	16.97	17.31
2024	19.96	17.57	16.73	16.06	16.73	17.06
2025	20.42	17.97	16.68	16.01	16.68	17.01
2026	20.89	18.38	16.88	16.20	16.88	17.22
2027	21.36	18.80	17.14	16.45	17.14	17.48
2028	21.84	19.22	17.38	16.68	17.38	17.73
2029	22.34	19.66	17.89	17.17	17.89	18.25
2030	22.84	20.10	20.10	18.69	20.10	20.50
2031	23.36	20.56	22.48	20.91	22.48	22.93
2032	23.89	21.02	26.50	24.65	26.50	27.03
2033	24.43	21.50	30.05	27.95	30.05	30.65
2034	24.98	21.98	33.38	31.04	33.38	34.05
2035	25.55	22.48	32.80	30.50	32.80	33.46
2036	26.13	22.99	36.24	31.14	33.49	36.90
2037	26.72	23.51	40.04	31.80	34.19	40.58
2038	27.32	24.05	44.25	32.47	34.91	44.02
2039	27.94	24.59	48.89	33.15	35.64	47.32
2040	28.57	25.15	54.02	33.84	36.39	50.54

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CO2 Price (\$/Metric Ton)						
Analysis	Spring 2012 and Fall 2012 Welsh 1 and 3 and Pirkey.		Summer 2014 and 2015 Welsh 1 and 3 and Pirkey			
Forecast Release Date	Fall 2011 - 2012		Fall 2013	Summer 2014		
Forecast Name	Fleet Transition - CSAPR (Base Band)	Fleet Transition - CSAPR (Low Band)	Fleet Transition (Base Band)	CPP with \$15- \$25/ton CO2 Price	CPP with \$25- \$40/ton CO2 Price	CPP with No CO2 Price
2012	0.00	0.00				
2013	0.00	0.00	0.00			
2014	0.00	0.00	0.00			
2015	0.00	0.00	0.00	0.00	0.00	0.00
2016	0.00	0.00	0.00	0.00	0.00	0.00
2017	0.00	0.00	0.00	0.00	0.00	0.00
2018	0.00	0.00	0.00	0.00	0.00	0.00
2019	0.00	0.00	0.00	0.00	0.00	0.00
2020	0.00	0.00	0.00	15.00	25.00	0.00
2021	0.00	0.00	0.00	15.29	25.47	0.00
2022	15.08	15.08	15.08	15.58	25.96	0.00
2023	15.28	15.28	15.28	15.88	26.47	0.00
2024	15.48	15.48	15.48	16.19	27.00	0.00
2025	15.67	15.67	15.67	16.51	27.52	0.00
2026	15.88	15.88	15.88	16.84	28.08	0.00
2027	16.08	16.08	16.08	17.17	28.62	0.00
2028	16.29	16.29	16.29	17.50	29.18	0.00
2029	16.50	16.50	16.50	17.85	29.74	0.00
2030	16.72	16.72	16.72	25.00	40.00	0.00
2031	16.94	16.94	16.94	25.47	40.76	0.00
2032	17.16	17.16	17.16	25.96	41.52	0.00
2033	17.38	17.38	17.38	26.44	42.31	0.00
2034	17.61	17.61	17.60	26.93	43.09	0.00
2035	17.84	17.84	17.84	27.43	43.88	0.00
2036	18.07	18.07	18.07	27.93	44.69	0.00
2037	18.31	18.31	18.31	28.44	45.50	0.00
2038	18.55	18.55	18.55	28.96	46.34	0.00
2039	18.79	18.79	18.79	29.50	47.19	0.00
2040	19.04	19.04	19.04	30.04	48.06	0.00

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-24:

Please provide the total test year cost of each SPP non-energy ancillary service purchased by SWEPCO during the test year that is not recovered through the Company's base rates.

Response No. CARD 7-24:

All SPP ancillary services purchased by SWEPCO during the test year are recovered via base rates.

Prepared By: Tiffany A. Powell Day

Title: Regulatory Acctg Case Mgr

Sponsored By: Michael A. Baird

Title: Mng Dir Acctng Policy & Rsrch

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-25:

Please provide the total test year revenue for each SPP non-energy ancillary service sold by SWEPCO during the test year, that is not recovered through the Company's base rates.

Response No. CARD 7-25:

All SPP ancillary services sold by SWEPCO during the test year are recovered via base rates.

Prepared By: Tiffany A. Powell Day

Title: Regulatory Acctg Case Mgr

Sponsored By: Michael A. Baird

Title: Mng Dir Acctng Policy & Rsrch

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-26:

Please provide the volume (tons) and associated dollar value of coal inventory requested by SWEPCO in rates in this case for each coal plant.

Response No. CARD 7-26:

Please refer to Schedule E2.2.

Prepared By: Michael H. Ward

Title: Regulatory Consultant Staff

Sponsored By: Amy E. Jeffries

Title: Coal Procurement Mgr

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-27:

Please provide SWEPCO's current coal inventory target (tons and days burn) along with supporting analysis and assumptions for each coal plant.

Response No. CARD 7-27:

Please refer to CARD 7-27 Highly Sensitive Attachment 1.

CARD 7-27 HIGHLY SENSITIVE Attachment 1 responsive to this request is HIGHLY SENSITIVE PROTECTED MATERIAL under the terms of the Protective Order. Due to current restrictions associated with COVID-19, this information is being provided electronically and a secure login to access the information will be provided upon request to individuals who have signed the Protective Order Certification.

Prepared By: Michael H. Ward

Title: Regulatory Consultant Staff

Sponsored By: Amy E. Jeffries

Title: Coal Procurement Mgr

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-28:

Please provide the average daily coal burn (tons) for each SWEPCO coal-fired generating unit for the test year, 2017, 2018, and as currently forecasted for 2021, 2022 and 2023.

Response No. CARD 7-28:

Plant (Total)	2017	2018	Test Year	2021	2022	2023
FLINT CREEK	4,682.7	4,509.6	3,241.7	3,811.5	3,067.8	3,056.4
TURK	6,259.9	5,934.9	5,315.6	4,022.2	4,979.8	4,386.5
WELSH	9,611.6	9,675.7	6,697.9	5,466.9	2,493.0	1,339.9

Prepared By: Michael H. Ward

Title: Regulatory Consultant Staff

Sponsored By: Amy E. Jeffries

Title: Coal Procurement Mgr

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-29:

Please provide the volume (tons) and associated dollar value of lignite inventory requested by SWEPCO in rates in this case for Pirkey and for Dolet Hills.

Response No. CARD 7-29:

Please refer to Schedule E2.2.

Prepared By: Michael H. Ward

Title: Regulatory Consultant Staff

Sponsored By: Amy E. Jeffries

Title: Coal Procurement Mgr

**SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415**

**SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION**

Question No. CARD 7-30:

Please provide SWEPCO's current lignite inventory target (tons and days burn) along with supporting analysis and assumptions for Pirkey and for Dolet Hills.

Response No. CARD 7-30:

Please see CARD 7-27 HIGHLY SENSITIVE Attachment 1.

Prepared By: Michael H. Ward

Title: Regulatory Consultant Staff

Sponsored By: Amy E. Jeffries

Title: Coal Procurement Mgr

SOAH DOCKET NO. 473-21-0538
PUC DOCKET NO. 51415

SOUTHWESTERN ELECTRIC POWER COMPANY'S RESPONSE TO CITIES
ADVOCATING REASONABLE DEREGULATION'S SEVENTH SET OF REQUESTS
FOR INFORMATION

Question No. CARD 7-31:

Please provide the average daily lignite burn (tons) for SWEPCO's share of Pirkey and Dolet Hills for the test year, 2017, 2018, and as currently forecasted for 2021, 2022 and 2023.

Response No. CARD 7-31:

Plant (SWEPCO Share)	2017	2018	Test Year	2021	2022	2023
DOLET HILLS	1,850.5	1,206.3	1,149.8	915.2	-	-
PIRKEY	8,525.2	9,006.2	5,330.5	6,688.9	5,384.6	2,915.4

Prepared By: Michael H. Ward

Title: Regulatory Consultant Staff

Sponsored By: Amy E. Jeffries

Title: Coal Procurement Mgr